DOCUMENT RESUME

ED 202 117 EA 013 566

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TITLE A Study to Establish the Reliability and Validity Estimates for Three Measures of Structural Coupling in Schools.
PUB DATE Apr 81
NOTE 34p.; Paper presented at the Annual Meeting of the American Educational Research Association (Los Angeles, CA, April 13-17, 1981).

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Elementary Secondary Education; *Interprofessional Relationship; Interviews; Measurement Techniques; Observation; Organizational Communication; Predictive Validity; Research Methodology; School Organization; Surveys; *Teacher Administrator Relationship; *Teachers; *Test Reliability; *Test Validity
IDENTIFIERS Kansas; *Structural Coupling (Organizations)

ABSTRACT

To assess structural coupling in schools, investigators must first have measures with established reliability and validity levels. Structural coupling refers to the mechanisms and norms in organizations that influence interactions among individuals. For three structural coupling measurement techniques--participant observation, interviews, and surveys--the study estimated content, construct, convergent, and predictive validity levels and test-retest and internal consistency reliability levels. Interview and participant observation data were gathered at a junior high and a high school in one Kansas school district. Survey data came from 145 teachers and administrators in 67 schools in 48 Kansas school districts. The structural coupling measures demonstrated excellent psychometric characteristics. The correlation coefficients for the construct and convergent validity estimates were high with few exceptions. The predictive validity estimates add further evidence that the measures were efficacious. (Author/RW)

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A STUDY TO ESTABLISH THE RELIABILITY AND VALIDITY ESTIMATES FOR THREE MEASURES OF STRUCTURAL COUPLING IN SCHOOLS

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Paper presented at the Annual Meeting of the American Educational Research Association, Los Angeles, April 1981

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ABSTRACT

A STUDY TO ESTABLISH THE RELIABILITY AND VALIDITY ESTIMATES FOR THREE MEASURES OF STRUCTURAL COUPLING IN SCHOOLS

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The purposes of the study were to establish the validity and reliability levels of three structural coupling scales. Specifically content, construct, convergent, and predictive validity levels, and test-retest and internal consistancy reliability levels were estimated. The structural coupling measures demonstrated excellent psychometric characteristics. The correlation coefficients for the construct and convergent validity estimates were high with few exceptions. The predictive validity estimates add further evidence that the measures are efficacious. The internal consistancy values range from .79 to .91.

A STUDY TO ESTABLISH THE RELIABILITY AND VALIDITY ESTIMATES FOR THREE MEASURES OF STRUCTURAL COUPLING IN SCHOOLS

Structural coupling defines mechanisms and norms in schools that strongly influence how individuals interact. The concept is important because the effectiveness levels of existing and proposed educational programs depend on cooperative actions by teachers and administrators. For instance, the formulation and implementation of individualized educational programs for learning disabled adolescents require high levels of cooperative planning or decision making, communication, and effort by educators. An even more tenuous set of interactions occurs when students change from a middle or junior high school to a high school. Cooperative planning and communication between educators at the different school levels must be extensive or the progress of the students will be disrupted.

As public attention focusses on the processes of education, scholars will continue to search for knowledge that explain the many unique aspects and correlates of change and effectiveness in educational organizations. Currently, coupling, as a metaphor, is being used to examine schools. The theoretical foundation for coupling is closely related to the ideas of linkages and flows within organizations as presented by Mintzberg (1979). Before significant advances can be made in our understanding of these important factors, efficacious measures must be developed. Therefore, the objectives for this study were to establish the reliability and validity levels for three measures of structural coupling.

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[1]This research was supported by a grant from the Learning Disabilities Institute, the University of Kansas (BEH Contract No. 300-77-0494).

Structural Coupling of School Activities

The dominant school form in the United States has become large scale units organized as bureaucracies and managed by political systems (Meyer and Rowan, 1978). A common assumption is that, as the scale of schools expand, higher levels of coordination and integration are required. Bureaucratic controls then emerge to structure the activities efficiently. This traditional theoretical explanation of organizational control has been assumed to hold for school systems. The basic premise is that multi-tiered organizations are necessary to plan adequately and to communicate accurately the school system's objectives from top to bottom, to monitor actions and outcomes, and, if necessary, to order corrective actions (Ouchi, 1978).

Using the accepted conceptualization, Dornbusch and Scott (1975) were surprised to discover no evidence of effective evaluation or control in school systems. Support is mounting for the proposition that schools lack close internal coordination, especially for the content and methods of instruction. Meyer and Rowan (1978) conclude that instruction tends to be removed from the control of the organization structure, in both its bureaucratic and colleague aspects. These findings and observations have led to a variety of speculations, including those of March and Olsen (1976) and Weick (1976, 1980), concerning schools as being loosely coupled.

Loose coupling means that the parts, units, or subsystems are relatively disconnected and lack interdependencies. Weick (1976) described the concept with the image that while the parts of a school are responsive to each other, each preserves its own identity and physical or logical separateness. A result is that the activities of

one part exert less impact on other units than had been assumed. The change in perspective suggests that some school functions are less interdependent than would be predicted by traditional bureaucratic theory.

Mintzberg provides the background for understanding coupling as an important concept of organizations. Organizations as conceived by Mintzberg are composed of five parts: the strategic apex, the techno-structure, the support staff, the middle line administrators, and the operators. Using this division, a complex set of flows and linkages among the five parts are postulated. The primary flows defined by Mintzberg are authority, work materials, information, and decision process. These flows represent linkages or coupling mechanisms that bind the organizational structure. Careful investigations of these flows hold high potential for better understanding the influence of organizational structure on the processes of schools.

Mintzberg classifies educational organizations as professional bureaucracies which depend on the standardization of skills in the operating core for coordination. Within the operating core the individuals work independently of their colleagues while maintaining close interactions with clients. For example, in schools structural looseness results as teachers work alone in classrooms with extensive autonomy in areas of subject content and methods of instruction. (Bidwell 1965).

Using Mintzberg's model of a professional bureaucracy, this autonomy is a result of the standardization of skills. In school systems, teachers typically are employed with the assumption that they possess the basic skills necessary for teaching students. Once a teacher is placed in a classroom, little supervision is required. The teachers are subjected

to a few short days of inservice orientation, given the approved handbooks, and left alone in the classroom to practice their skills with students and to carry out the mission of the school district. School systems assume that teacher training programs and state certification standards produce teachers with adequate competencies to perform the teaching tasks. Similar to other professional bureaucracies, this procedure is not unlike that used by hospitals, universities, or other social service agencies.

In professional bureaucracies Mintzberg maintains that the operating core becomes the key part of the organizational structure. The support staff is usually the second most dominate area. In schools the support staff provides a varity of services from the curriculum supervisors to the libraries, custodial services, food service, student personnel service, and other special service programs. All of these services are provided to help the teachers better perform the tasks of teaching. The remaining areas of the organizational structure of schools are not highly elaborated. There is little need for the strategic apex (superintendent/Board of Education), technostructure (business manager/assistant superintendent), or middle line managers (principal/assistant principal) to be involved in the direct supervision of teachers. While all of the parts of the orgainzation described by Mintzberg are present, the operators or teachers are the individuals who make most of the instructional decisions. With this degree of teacher independence the formal linkages and flows may have little impact on the work process in schools. This condition is described by Thompson (1967) as pooled coupling. In this form of coupling little need exists for interdependencies among members of the organization. When a school situation is

characterised by pooled coupling, teachers may share facilities and budget, but work alone with students. Teachers working alone have little need for coordinating mechanisms. The classic illustration is that teachers close the doors and conduct their classes independently of others. Except in special circumstances, only the students observe the instructional processes of teachers. Administrators and colleagues, therefore, have limited direct influence on what teachers do in their classrooms. If a school is loosely coupled, a teacher can, to a great degree, act independently of colleagues and administrators. A move to high levels of communication and cooperation might lead to reduced morale and productivity.

This conclusion is generally supported by the findings of Meyer, Scott, Cole and Intili (1978). Within a given school, teachers exhibit little agreement when describing school and classroom practices. The exceptions are situations in which teachers are interdependent through team or group activities such as writing and evaluating of IEPs. Expanding this idea, Bridges and Hallinan (1978) maintain that work system interdependence is present in schools where a high frequency of teacher interaction is present. Interactions occur to coordinate the work activities and to satisfy the human need to be closely associatted in work with colleagues. Attaining high levels of rewards from peer group relations, increases attractiveness of the work situation and enhances the balance between work inducements and contributions.

Teachers experience considerable professional independence in schools; however, teachers do work cooperatively in some situations. The formal organization often develops strategies to tie various parts of the school together. Teachers are involved in periodic inservice

training programs, faculty meetings, and committee assignments. These represent attmepts of the organization to use the flows of authority, information, and work processes. At the building level teachers are often assigned to work together. Duty assignments usually deal with supervision such as hall, bus, or lunchroom duty. In these situations, the teachers are used by the organization to make decisions, but, even here, the operators enjoy collective autonomy.

Another instance illustrating teachers working together is the sharing of facilities, and equipment. Teachers are often required to coordinate the use of materials in schools. Rarely does a school have enough books or audio-visual equipment to individually assign them to teachers. Teachers must cooperate to utilize what is available. The act of teaching is still dominated by the individual teacher but the decisions of the orgainzation in the placement of equipment has required teachers to work together.

If teachers continue to demand more professional status, teacher autonomy may be further entrenched in the structure of schools. Bidwell (1965) argues that in order to deal with the variability of students on a daily basis, teachers need professional autonomy. Schools are currently structured to allow this type of organization in the areas of instruction and planning. Therefore, teacher militancy and the resulting increases in autonomy may have little impact on school structure, but may reinforce the status quo and promote loose structural coupling. Katz (1968) supports this contention when he suggests that the rules which allow teacher autonomy are as much a part of the formal structure of the organization as are the rules that require teacher compliance. Professional autonomy includes the right of the

teachers to plan and instruct as they see fit. In other words, teachers in loosely coupled schools select their colleagual associations, teaching styles, and instructional strategies independently.

Team or group activities such as cooperative planning or decision making and communication, therefore, represent exceptions to loose coupling of a school's operating core and suggest important areas of study for interactive interventions such as the learning strategies model. Some organizational configurations and group practices do promote coupling. For example, teachers and other personnel within and across subject areas and special services may formally or informally assume the shared responsibility for accomplishing a set of educational objectives. They collaborate; that is, educators communicate and plan interdependent sequences of classroom or other activities. The teachers then become responsive to each other and if one changes the content or process, an impact is made on the others. To avoid dysfunctional actions, the teachers improve their abilities to communicate and to plan cooperatively.

In schools using more traditional designs, work dependencies for teaching and planning occur on a more informal basis. Teachers share ideas and teaching techniques. These informal flows are more fluid. Within each school there are work constellations with different areas of organizational decision making with nerve centers or key individuals effecting communication between the work constellations. These examples of work dependencies serve as one basis to measure the level of coupling between teachers in schools.

Teachers interact with other teachers. In any teachers lounge the conversation is interspersed with topics such as teaching techniques

or student needs. While the conversation is not always work related, a great deal of information is exchanged. Information flows both vertically and horizontally throughout the school organization. School administrators attempt to direct the flow of information by having faculty meetings and publishing weekly calenders. In addition administrators and teachers talk about student needs/materials requests, and curriculum concerns. The formal and informal levels of communication between teachers and between teachers and administrators are indicative of the degree of coupling in a school.

Organizational structure as described by Mintzberg and the metaphor of coupling as developed by Weick form a pattern that suggests a method for measuring coupling in schools. The flows of authority, work materials, information, and decision process require some form of communication which often result in developing work dependencies among teachers. Meyer and Cohen (1971) recognized the role of work interdependence and communication in their study of teacher influence and autonomy in open spaced schools. They developed measures to determine the levels of communication and work dependencies in schools.

Before the hypotheses can be tested adequately, valid and reliable measures of the structural coupling must be developed. Therefore, the following research questions guided the study.

1. What are the content, construct, convergent, and predictive validity levels of the structural coupling assessment measures?

2. What are the test-retest and internal consistency reliability levels of the structural coupling measures?

METHODOLOGY

Subjects

Teachers and administrators were the subjects in this phase of the investigation. Separate samples were drawn for each type of measurement--observation, interview, and survey. The classes of two teachers who taught students with learning disabilities were selected for observation. One was in a high school and the other was in a junior high school. Both were in the same suburban school district. The senior high school had 1,125 students and a staff of 63 professionals. The junior high school had 557 students and 32 professional staff members. In the same two schools, the two LD teachers, the two principals, and three randomly selected regular teachers were interviewed.

In addition, 145 teachers and administrators completed the assessment instruments. This represents a response rate of 58% for 250 instruments that were distributed. The educators who completed the survey instruments were from these two schools and graduate students at the University of Kansas. Overall, educators from 67 schools in 48 districts participated. Most of the districts were located in the northeastern quadrant of Kansas. The 145 respondents represent a diverse population of educators: teachers from 20 subject areas, including 25 LD teachers, and 100 women and 45 men, with an average of five years experience. Finally, 35 of the 145 subjects completed the structural coupling measures again after a time lapse of about six weeks.

Instrumentation

The measurement system contains multiple indicators for each variable and three methods of data collection--participant observer, interviews, and assessment instruments. This allowed for the

reliability and validity estimates to be established in a fashion approximating the multitrait-multimethod technique proposed by Campbell and Fiske (1959). The components of the measurement system will be discussed separately.

Participant observer method. This methodology typically is classified as an ethnographical or anthropological approach. The participant observer role is one in which the researcher is known to all and is present in the school as a scientific observer. The investigator participates by being present and usually is allowed to do what observers do rather than being expected to behave as others behave. The focus in this study was on behaviors indicative of work interdependence and communication. Since the field settings of schools are extremely complex, it was essential to clearly determine what is to be observed, where observations are to be made and a means to record the data accurately and systematically. The theoretical models involving flows and linkages served as general guides to select and classify the observations.

Before the observation phase of the research began, the three investigators studied and defined carefully the components of organizational structure as well as the methods of ethnography and observation. The observation techniques were field tested in the LD classroom of a middle school in a suburban school district. During the observations researchers recorded all activities that were relevant to the concepts of interest. After each class period, the observers compared notes to ensure they each had covered the same material. The notes indicated a high degree of consistency.

The researchers then contacted the appropriate officials and

obtained permission to observe classes at a high school and a junior high school in a neighboring suburban school district. At both schools the researchers met with the principal and the LD teacher. The project was explained and the LD teacher in both instances gave the researchers a tour of the building and the LD classroom. Schedules for visitation were set at this time and informed consent statements were signed by the individuals who were to participate in the study.

The observation schedules were designed so that each researcher would observe both LD classrooms at various times during the school day. During the first two visits, the researchers attended both the junior and senior high school LD classes together. After these initial periods the field notes were compared and discussed. For most of the remaining observations, one researcher concentrated on the junior high, the other on the senior high. In all, nine observations were made. The researchers observed together two times at each school. An additional two visits were made by one researcher to the junior high and three visits by the other researchers to the high school. When the observations were completed, the notes were typed, coded as to which concept they defined, and numbered.

Personal interview method. The interview schedules were comprised of items based on appropriate theoretical foundations. A variety of question types were employed (i.e., leading, critical incident and comparative items). The questions asked the teachers and administrators to give examples of cooperative planning and communication. The teachers, for instance, were asked to describe verbally the frequency that they conferred with other teachers about teaching strategies for student groups, such as those with learning disabilities. Content analysis categories

with detailed descriptors were derived from the theories. The interview schedules and content analysis categories can be requested form the first author.

This phase of the research involved interviewing teachers and administrators from the two schools in the suburban districts in which the participants observations had been conducted. Based on the recommendations of the LD teachers, five teachers from each building were contacted. The principal from each building was asked for an interview. All agreed to participate. The interviews were tape recorded to aid in transcription. There were 27 structured questions of an open ended nature so the individual could elaborate on the issues as desired. Nine interviews were conducted. In the junior high school four people were interviewed--the principal, the LD teacher, and two classroom teachers. In the high school five people were interviewed--the principal, the LD teacher, and three classroom teachers. Once the interviews had been completed and transcribed, they were combined with the observation fieldnotes and prepared for content analysis.

Content analysis. The field notes were content analyzed based on definitions of structural coupling. A copy of the categories, definitions, and example statements can be secured from the first author. Definition of the concept was enhanced to include five degrees. Coupling was defined as loosely coupled, moderately loosely coupled, coupled, moderately tightly coupled, and tightly coupled in two areas--teacher to teacher coupling and administrator to teacher coupling. Fifty items were chosen randomly from the coupling statements. Researchers rated the items twice with two weeks in between ratings. As described by Winer (1971, 283-296) intercoder reliability was estimated using a one-way ANOVA.

Reliability estimates for the observation records for the first and second content analysis procedures are as follows: .77 and .74 for administrator-teacher coupling and .80 and .80 for teacher-teacher coupling. These estimates exceeded the previously set criterion of .70 and indicate that the categories were efficacious.

Survey method. This method used paper and pencil scales to measure structural coupling. This system is by far the most common method of observation and data collection in the behavioral sciences (Kerlinger, 1973). The scales are more objective and less inferential than the other two measurement techniques. In general, these instruments asked for descriptions by administrators and teachers of the school situation. Descriptions of the scales follow.

Three short instruments (see Appendix A) were used to measure the structural coupling variable. The first was developed by Bridges and Hallinan (1978) and is called the Intensity of Work System Interdependence (IWSI) scale. The IWSI lists 13 activities and asks how frequently the teachers jointly work together on these items. The frequencies are summed with a range of 0-65. The higher the score, the tighter the coupling. Several of the items deal with coupling of the instructional process. The developers reported that the alpha coefficient as an estimate of reliability of .95 (N=165). Validity data also are provided. Teacher scores correlate at .56 with principal scores and -.60 with the variable percent of time that teachers work in isolation.

Coupling was also measured by a communication measure refined by Bridges and Hallinan. The items in the communication measure are simular to those developed by Meyer and Cohen (1971). These early items were used to compare levels of communication in schools with

open space designs and schools with self contained classrooms. The items are related to the flow of information and decision making. In addition, the measures indicate the degree of coupling by identifying linkages.

For each of seven topics (five task-relevant and two task-irrelevant), teachers checked the frequency with which they talk with other teachers: daily, several days a week, once a week, once or twice a month, once or twice a semester, and never. The weight assigned to these six frequency categories approximates the absolute magnitude of differences among the categories: daily (5.0), several days a week (2.5), once a week (1.0), once or twice a month (.5), once or twice a semester (.25), and never (0). The communication score is determined by summing the weights of seven items. The theoretical range of scores is 0-35; the alpha coefficient as an estimate of reliability for the seven items in the communication index is .88 (n=193). Content validity was established for these scales. In addition, the directions were rewritten to ask for frequency with which teachers talk with the principal. Therefore, the two measures will be coupling of communication (a) between teachers and (b) between teachers and the principal. The items for each scale are given in Appendix A. In addition, two general measures of structural coupling, developed by Hoy (1979) were used to examine the convergent validity of the three specific measures of this investigation. Hoy's instruments measure the coupling of student discipline and coupling of the instructional program. The reliability estimates for these measures are about .85.

Each measure contained a demographic information section. The demographic information included name, school district, building, level,

position, highest degree earned, years of experience in education, and the number of years in the present position.

RESULTS

To establish the reliability and validity estimates, two procedures were used. First, the item analysis program in Statistical Package for the the Social Sciences was used to calculate item and scale means, standard deviations, item correlations with the scale, and Cronbach's (1959) alpha coefficient. Second, product moment correlation coefficients were calculated to assess the relationships between scales and the test-retest reliability estimates.

The findings from the data analysis procedures are presented for each research question. The results follow.

Research Question One Concerning the Validity Levels of the Structural Coupling Assessment Instruments

Content and construct validity. Panel and statistical techniques were used. The panel had three members with experiences as a professor, as public school teachers, and as an administrator. They judged the adequacy of the items for sampling the relevant theoretical constructs. The panel concluded that the structural coupling items were representative of the content of the theoretical definitions of the concepts. Therefore, content validity is evident.

Item analyses procedures were used on the pilot data to determine if the items correlated with the overall structural coupling constructs represented by the scales. High positive correlations provide support for construct validity. Tables 1 and 2 provide summaries of the item analysis results.

Tables 1 and 2 about here

Generally, the means and standard deviations demonstrate adequate variability but some of the items tend to approach the end of the scale. The correlation coefficients are very high and positive, indicating similarity of the items in the scale. Therefore, the earlier validity estimates of Bridges (1979) and the present results lend support to the assertion that the structural coupling measures have construct validity.

Convergent validity. The scores of the structural coupling instruments were correlated with those from the participant observer and interview measurement methods to establish convergent validity. The correlation coefficients for this portion of the study constitute Table 3.

Table 3 about here

The coupling measures, scales 1, 2 and 3 in Table 3, are significantly correlated with Hoy's instruments, scales 4 and 5. The coefficients range from .22 to .54 with five of the six being significant beyond the .01 level. These results strongly support the convergent validity of the IWSI and the two communication measures. The correlations between methods provide little added evidence for validity. With one exception, none of the coefficients are significant. The extremely limited sample size could have played a dominant role in this portion of the study. In summary, strong convergent validity was evidenced between the two sets of structural coupling measures.

Predictive validity. This will be determined over the duration of the research project. The scores on the coupling indicators should predict which schools, groups, and teachers will most successfully

implement new programs and have high levels of cooperative planning between LD teachers, regular classroom teachers, and administrators.

As an intermediate step, variables normally predicted by school structure were included as a preliminary check of predictive validity. Bridges found that the IWSI correlates negatively at the -.60 level with the variable percent of time that teachers work in isolation. Other studies have consistently found a positive correlation between school structure or coupling and teacher job satisfaction and perceived organizational effectiveness. These three criterion variables were included to make a preliminary estimate of the predictive validity. The satisfaction and effectiveness measures are available on request from the first author.

Table 3 contains the correlation coefficients for the predictive validity estimates. Intensity of work system interdependence is correlated with teacher isolation at -.20, with perceived school effectiveness at .32, and with job satisfaction at .34. Communication level among teachers is correlated with the same three variables at -.15, .27, and .24, respectively. Similarly, communication level between teachers and principal is correlated with the criterion variables at -.04, .33, and .19. With the exception of the -.04 correlation coefficient, all are significantly different from zero. Therefore, preliminary evidence of predictive validity is apparent for the structural coupling measures.

Research Question Two Concerning the Reliability Levels of the Structural Coupling Assessment Instruments

Internal consistancy reliability. Alpha coefficients (Cronbach, 1959) were calculated to estimate the reliability levels of the

structural coupling assessment instruments. This is a variation of the split-half technique that estimates the correlations between two random samples from a universe of items similar to those in a scale. The coefficients for the structural coupling measures are summarized in Table 4. In addition, the means and standard deviations of the total scales are presented. The alpha coefficients are high--.91, .79, and .87. The results support the conclusions that the internal consistancy levels of the three scales are high and that the scales have characteristics of excellent measures.

Table 4 about here

Test-retest reliability. The instruments were completed by the same subjects twice--once in early June, 1980 and late July or August, 1980. From the original 99 participants, 32 completed the three structural coupling scales six-to-eight weeks after the original administration. The results are summarized in Table 5. The correlations between the scores are .74 for cooperative planning, .73 for communication among teachers, and .55 for communication with the principal. Given the lapse of time between the testing sessions, the reliability estimates support the conclusion that the scales are stable measures of the coupling processes.

Table 5 about here

SUMMARY AND CONCLUSIONS

The purposes of this study were to establish the validity and reliability levels of structural coupling measures. Specifically, content, construct, convergent, and predictive validity levels, and test-retest and internal consistancy reliability levels were estimated. The general conclusions are that the purposes were substantially achieved, and that the validity and reliability levels are adequate for use in future studies of structural coupling. Other observations about the procedures and results follow.

The structural coupling measures demonstrated excellent psychometric characteristics. The correlation coefficients for the construct and convergent validity estimates were high with a few exceptions. Moreover, the predictive validity estimates add further evidence that the measures are efficacious. In addition, the internal consistency values exceeded the criterion of .70 with alpha levels ranging from .79 to .91. Finally, the measures displayed characteristics similar to those found in the earlier study by Bridges and Hallinan (1978).

Another issue to be considered is the lack of relationships between the results of the interview and assessment instrument techniques. The most obvious reason is the small size of the sample. The intensity of the interview and content analysis procedure requires so many resources that only a very limited number of subjects could be included. Therefore, the sample size mitigated against finding support across methods. Another reason is suggested by Hernes (1976). Coupling and expectancy produce subtle effects and require very sensitive devices to detect their presence. Processing the interview data through the content analysis procedure by the researchers could well

have eliminated the systematic relationships. Much more effort would be required to test adequately the relationships across the methods.

The results support the contention that the measures have adequate validity and reliability levels to be used in further research efforts. Therefore, the subsequent step is to test the hypotheses drawn from the organizational literature. For example, by examining the quantity and quality of the flows and linkages as defined by Mintzberg, the degree of coupling in schools can be determined. The levels of teacher to teacher and teacher to administrator communication as well as work interdependence provide appropriate mechanisms to measure the unique properties of schools as professional bureaucracies. Teachers deliver services to students. As new procedures and strategies are developed, it is hypothesized that information be received and shared among teachers if effective schools are to emerge. The three measures of coupling developed in this study address the important linkage and flow variables can and will assist scholars to gain a better understanding of educational organizations.

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Table 1

Summary of the Item Analysis Procedures for the Intensity of Work System Interdependence Scale in the Structural Coupling Instrument

Item	Mean	Standard Deviation	Item Correlation with Scale
a	2.17	2.02	.51
b	2.24	1.95	.64
c	2.28	1.93	.61
d	1.84	1.98	.52
e	.97	1.57	.52
f	1.68	1.49	.73
g	1.48	1.61	.74
h	1.04	1.46	.66
i	.89	1.40	.67
j	.73	1.43	.65
k	.75	1.48	.62
l	1.26	1.75	.70
m	2.09	1.81	.55

Note 1. The items are provided in Appendix A.

Note 2. The range for the response scale is 0 to 5.

Note 3. The degrees of freedom equalled 97 and the critical values of r at the .05 and .01 levels are .16 and .23 respectively.

Table 2

Summary of the Item Analysis Procedures for the Two Levels of Communication Scales in the Structural Coupling Instrument

	Frequency of Discussion					
	Teachers with Teachers			Teachers with the Principal		
Item	Mean	Standard Deviation	Item Correlation with Scale	Mean	Standard Deviation	Item Correlation with Scale
a	1.11	1.34	.53	.62	.97	.64
b	1.39	1.32	.65	.58	.88	.72
c	.97	1.30	.63	.65	1.06	.73
d	1.18	1.33	.48	.86	1.21	.74
e	1.77	1.73	.58	.97	1.28	.71
f	2.04	1.67	.46	.77	1.21	.54
g	3.64	1.83	.27	1.57	1.75	.40

Note 1. The items are provided in Appendix A.

Note 2. The range for the response scale is 0 to 5.

Note 3. The degrees of freedom equalled 97 and the critical values of r at the .05 and .01 levels are .16 and .23 respectively.

Table 3

Summary of the Correlation Coefficients Indicating the Convergent and Predictive Validity Levels of the Structural Coupling Instrument

	Method									
	Assessment Instruments								Interviews	
Scale	1	2	3	4	5	6	7	8	9	10
1	-								-69*	-27
2	45	-							-22	-09
3	37	53	-						-49	-37
4	29	22	31	-					-48	-35
5	54	31	38	62	-				-28	-76*
6	-20	-15	-04	-09	-21	-				
7	32	27	33	36	51	-13	-			
8	34	24	19	28	48	00	23	-		

Note 1. 1 = Intensity of Work System Interdependence, 2 = Communication Level among Teachers, 3 = Communication Level between Teachers and Principal, 4 = Coupling of Discipline Procedures, 5 = Coupling of the Instructional Program, 6 = Isolation, 7 = Perceived School Effectiveness, 8 = Job Statisfaction, 9 = Administrator-Teacher Coupling, 10 = Teacher-Teacher Coupling.

Note 2. For scales 1-8 the degrees of freedom equalled 97 and the critical values of r at the .05 and the .01 levels are .16 and .23 respectively.

Note 3. For scales 9 and 10, the degrees of freedom equalled 5 and the critical values of r at the .05 and .01 levels are .67 and .83 respectively.

Note 4. The correlation coefficients have been multiplied by 100.

Table 4

Summary of Means, Standard Deviations, and Alpha Coefficients as Estimates of Reliability for the Scales in the Structural Coupling Instruments

Scale	N	Number of Items	Mean	Standard Deviation	Alpha
Intensity of Work					
System Interdependence	99	13	19.40	15.07	.91
Level of Communication among Teachers	99	7	12.10	6.95	.79
Level of Communication with Principal	99	7	6.04	6.21	.87

Table 5

Summary of the Means, Standard Deviations, and Test-Retest Reliability Estimates for the Scales in the Structural Coupling Instruments

Scale	N	Pre Mean	Pre SD	Post Mean	Post SD	r
Intensity of Work						
System Interdependence	41	21.60	16.78	25.34	16.76	.74
Level of Communication among Teachers	41	11.76	5.95	12.42	6.62	.73
Level of Communication with Principal	41	8.43	5.92	8.00	6.03	.55

APPENDIX A: STRUCTURAL COUPLING MEASURES

Structural Coupling Measure #1: Intensity of Work System Interdependence

1. How often on the average do you jointly engage in each of the following activities with members of the faculty? Circle the number which comes closest to describing how often you jointly engage in the activity each month. Please describe what actually occurs rather than what you believe should occur.
Response categories. Average Numver of Times Per Month: 0, 1, 2, 3, 4, 5+.

Jointly schedule use of physical space.
Jointly schedule use of instructional materials.
Jointly schedule use of instructional equipment.
Jointly schedule times when students will meet with particular teachers in the work group.
Jointly determine size of instructional groups.
Jointly select instructional materials.
Jointly select topics to be taught.
Jointly decide the order in which topics will be taught.
Jointly decide the methods to be used in teaching the topics.
Jointly prepare lessons or units.
Jointly teach lessons or units.
Jointly evaluate the progress of students.
Jointly decide how to handle student discipline problems.

2. What are the total number of hours you spend each week in school? Please consider all time spent at school including lunch hours and planning periods. _____

Of this total, how many hours do you work in isolation of other teachers? _____

Structual Coupling Measure #2: Communication with Peers

By placing a check mark ( ) in the appropriate column, please indicate how often you talk with other teachers about:
Response Categories: Daily, Several times a Week, Once a Week, Once or twice a Month, Once or twice a semester, Never.

General curriculum plans for a class.
Student reactions to a specific lesson.
The schedule of teaching activities.
Getting teaching resources or supplies.
Learning needs of a particular student.
Personal gripes or concerns about work.
Matters unrelated to school and teaching.

Structural Coupling Measure #3: Teacher Communication with Principals

By placing a check mark ( ) in the appropriate column, please indicate how often you talk with the principal, an associate or assistant principal about:

a. General curriculum plans for a class.
b. Student reactions to a specific lesson.
c. The schedule of teaching activities.
d. Getting teaching resources or supplies.
e. Learning needs of a particular student.
f. Personal gripes or concerns about work.
g. Matters unrelated to school and teaching.

Structural Coupling Measure #4: Hoy's Measure for Instructional Coupling

Response Categories = Always Often Occasionally Never

1. Control of students is left to the discretion of the teacher.
2. In my school there is a lack of administration control over student discipline.
3. Discipline procedures are tightly controlled in my school.
4. In my school there is a lack of communication about student discipline procedures.
5. Procedures for the control and discipline of students are closely followed by teachers.
6. Procedures for the control and discipline of students are closely followed by administrators.
7. A well-defined set of procedures exists for the control and discipline of students.

Response Categories = Frequently Often Sometimes Rarely

8. In my school teacher control of students is closely monitored by the administrators.
9. Teachers in my school consult with principals about student discipline.
10. Administrators closely monitor teacher adherence to procedures for the control and discipline of students.
11. Teachers consult with each other about student discipline and control.
12. Teachers consult with the principal or assistant principal(s) about student discipline and control.
13. Teachers consult with guidance counselors about student discipline and control.
14. Teachers consult with the assistant principal(s) about student discipline and control.

Structural Coupling #5: Hoy's Measure for Coupling of the Instructional Program

Response Categories = Always Often Occasionally Never

1. In my school there is a lack of communication about the teaching process.
2. There are few day to day working relations among teachers within the same grade level.
3. In my school there is a lack of administrative coordination over the teaching process.
4. In my school there is a lack of communication about the instructional program.
5. In my school there is a lack of administrative coordination over the instructional program.

Response Categories = Frequently Often Sometimes Rarely

6. My principal observes me teaching.
7. Teachers in my school consult each other about their teaching.
8. Teachers in my school consult with the principal about their teaching.
9. Teachers in my school consult with their supervisor about their teaching.
10. My supervisor observes me teaching.